REMARKS

Claims 26 - 31 have been rejected by the Examiner. By this amendment, Claims 26 and 28 have been amended.

THE 35 USC 112 REJECTION

The Examiner has rejected Claims 26 - 31 under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

In this regard the Examiner points to Applicants' specification (page 6) that describes the use of protective layers of benzotrozole, chlorite, or immersion tin in the context of the protection of copper. However, Applicants would like to point of that Applicants originally filed application, Serial No. 09/282,842 claimed these protective coatings as applicable to copper, nickel, gold, chromium, solder and alloys thereof.

However, in order to expedite prosecution Applicants have canceled that portion of Claim 26 calling for these protective coatings. In addition, dependent Claim 28 has been amended to limit the conductive metallic layer of Claim 26 to copper including a protective layer thereon, said protective layer selected from the group consisting of benzotriazole, chlorite, and immersion tin. Accordingly, Applicants believe that by these actions they have clearly overcome the Examiner's 35 USC 112 rejection.

THE 35 USC 102(a) REJECTION

The Examiner has further rejected Claims 26 - 31 under 35 USC 102(b) as being anticipated by Bindra, et al. In this rejection, the Examiner attempts to read the recited structure of independent Claim 26 and dependent Claims 27 - 31, element for element, on

Bindra, et al. However, as will be pointed out hereinafter, Bindra, et al. are lacking in several respects in meeting these recited claim limitations. The fact that Bindra, et al. does not meet these claim limitations will be clearer when it is understood that Bindra, et al. are directed to solving different problems than Applicants are solving, resulting in different structure than Applicants' structure.

Bindra, et al are directed to overcoming the manufacturing problems encountered in making high density circuit boards. Bindra, et al. implement their structure using 2S1P (two signal planes plus one power plane) power core units in a high performance printed circuit board arrangement wherein at least two circuitized power cores are laminated together. Vias and lands are opened in the power core structures and are filled with joining metal. The vias are then aligned and electrically connected to one another by dendrite connectors or solder, located between the joining metal within the aligned conductive vias.

DISTINCTIONS BETWEEN THE BINDRA, ET AL. TEACHINGS AND APPLICANTS' TEACHINGS

From the above brief description, it can be seen that the Bindra, et al. structure is not at all similar to that claimed by Applicants. Bindra, et al. is directed to encapsulated circuitized power core alignment and lamination in the fabrication of printed circuit boards. Applicants' invention, on the other hand, is directed to a chip carrier structure that employs conductive vias filled with one contiguous solder member to electrically connect and mechanically secure together two flexible circuitized substrates. The solder member unites aligned conductive apertures having an external surface on each of the flexible circuitized substrates by having a first contact portion extending from the external

surface of one flexible circuitized substrate and a second contact portion extending substantially within both of the aligned conductive apertures thereby providing an electrical connection therebetween and mechanically securing the substrates together. The solder member not only electrically connects and mechanically unites the two flexible circuitized substrates, it also acts as a connection point to chips on one circuitized substrate and to a printed circuit board on the other circuitized substrate.

The Examiner, in rejecting Claim 26, has taken the position that the arrangements shown in Figs. 4A and 4B of Bindra, et al. anticipate the "at least one solder member including ..." recitation. In this regard, the Examiner states that "the first contact portion including a cross-sectional configuration that is substantially oval or ellipsoidal" reads on solder member 2 in Figs. 4A, B.

The oval or ellipsoidal-like structures shown in Fig. 4A and 4B of Bindra, et al. are stated, in col. 5, lines 60 - 66, to be "slight protrusions" formed "after joining metallization (2) has filled the vias (8) and covered the lands (7)" (emphasis added). The Bindra, et al. disclosure, at this point, goes on to state that "4B shows 4A after alignment, in the process of being joined and laminated to two additional circuited power cores (11) and (12), one on each major surface, the joining metal (2) to fill the vias (8) of the additional cores by capillary action".

The reference to "capillary action" in Bindra, et al. is thus made in regard to filling the vias of circuitized power cores 11 and 12, similar to that shown in Figure 3D. The joining metal (2) is the source of metal for the capillary action to fill the vias. This would imply that the oval or ellipsoidal-like solder structure (2) disappears after capillary action fills the vias. Heat and pressure are employed by Bindra, et al. to flow joining metal (2),

by capillary action, into the vias and laminate the three power cores together to form a multilayer circuit board. Thus, unlike Applicants' assembled multilayer chip carrier structure, the Bindra, et al. multilayer circuit board structure, when assembled, apparently has no oval or ellipsoidal-like solder structure to aid in securing said layers together and provide electrical contact to a printed circuit board. Clearly, there is no teaching in Bindra, et al. of an assembled device having solder structure including an oval or ellipsoidal-like portion acting to both aid in holding the Bindra, et al. circuitized power cores together and providing a point of electrical contact.

Thus, Applicants' claimed structure is distinct because:

- Bindra, et al. assembled structure does not have an oval or ellipsoidal-like solder structure in a first contact portion;
- Bindra, et al. laminate the layers of the assembled structure together rather than employ a solder member to hold layers together; and
- Bindra, et al. are fabricating a printed circuit board not a chip carrier to be attached to a printed circuit board.

The Examiner, in rejecting Claim 27 on Bindra, et al., states that the "first and second circuitized substrates are comprised of polytetrafluoroethylene (PTFE) (col. 66: 11 - 13; col. 7: 44 - 48; col. 8: 35 - 37)". The Examiner has read the claimed first and second circuitized substrate on the structure shown in Fig. 4A and layer 11 in Fig. 4B of Bindra, et al. Applicants have not found any statement in Bindra, et al. that the structure in Fig. 4A and layer 11 in Fig. 4B are made of PTFE. The reference to PTFE (col. 6: 11 - 13) cited by the Examiner would seem to refer to layer 1 shown in Figures 2 and 3. See, for example, col. 7, lines 45 et seq. wherein the use of non-photosensitive material filled with PTFE is applied to the CPC's, as shown in Fig. 2A. Using this arrangement, Bindra, et al.

employ a lamination process to apply the non-photosensitive material filled with PTFE to the CPC's. Thus, the structure of Fig. 4A and layer 11 of Fig. 4B of Bindra, et al., upon which the Examiner is reading the "first and second circuitized substrates" limitation, does not appear to be PTFE, as asserted by the Examiner.

The Examiner, in rejecting Claim 28 on Bindra, et al., states that Bindra, et al. "discloses that the conductive apertures 8 of the first circuitized substrate (Fig. 4A) comprise holes having a cylindrical shape (Fig. 4A)". Claim 28 has now been amended to delete references to the shape of the conductive apertures and recites, instead, a conductive metallic layer including a protective layer. In so amending, Applicants have limited the conductive metallic layer to copper.

In rejecting parent Claim 26, the Examiner has stated that the copper material of Bindra, et al. includes "a protective layer of benzotriazole thereon (col. 6: 45 - 55: see table; col. 7: 56 - 58 and 66 - 68; col. 8: 1 - 3)". However, from Applicants' understanding of the cited column and lines of Bindra, et al., the benzotriazole referenced therein is not being used as a protective layer. In column 6, lines 45 et seq. the process described is for promoting subsequent photoresist adhesion and several rinse steps are described including a water rinse step after the benzotriazole step. Thus, it is not even clear that benzotriazole is left on the structure. Regardless, Bindra, et al. are not using a layer of benzotriazole, and to the extent they use benzotriazole, it is <u>not used as a protective layer</u>. Thus, Applicants firmly believe that Claim 28 now recites a further patentably distinct limitation.

As to the Examiner's rejection of Claims 29 and 30, notwithstanding the Examiner's column and line references in Bindra, et al., Applicants have not found specific

teachings anywhere in Bindra, et al. as to the temperature and materials specified in these claims.

As to the Examiner's rejection of Claim 31 on Bindra, et al., contrary to the Examiner's assertions, layer 12 of Bindra, et al. is not a printed circuit board. In column 5, lines 62 - 66, Bindra, et al. defines layers 11 and 12 as circuitized power cores. These power cores are used by Bindra, et al. to make a laminated printed circuit board and, thus, cannot be a distinct and separate printed circuit board to which an electronic chip carrier package is attached. The electronic chip carrier package recited in the claims has a solder member extending from the external surface of said first circuitized substrate that connects to a separate and distinct printed circuit board.

Although Applicants firmly believe that independent Claim 26, as rejected by the Examiner, clearly distinguishes over Bindra, et al., in order to even more clearly set forth these distinctions, Applicants have amended Claim 26. Claim 26 now recites that the second contact portion of the recited solder member extends "to at least said external surface of said conductive aperture of said second circuitized substrate". Thus, the claim now calls for a "substantially round, oval or ellipsoidal cross-sectional configuration" of solder on the lower, i.e., first contact portion of the solder member with the second contact portion extending to at least the external surface of said second circuitized substrate. Such structure, as claimed, acts to secure the layers together and provides electrical contact points to a printed circuit board through the first contact portion and to a chip through the second contact portion.

Attached hereto is a marked-up version of the changes made to Claims 26 and 28. The attached page is captioned **"VERSION WITH MARKINGS TO SHOW CHANGES MADE"**.

Accordingly, in view of Applicants' amendment to the claims and remarks, Applicants firmly believe the case is now in condition for allowance. Accordingly, Applicants respectfully request the Examiner to reconsider and withdraw his rejections, allow the claims as now presented and pass the case to issue.

Respectfully submitted,

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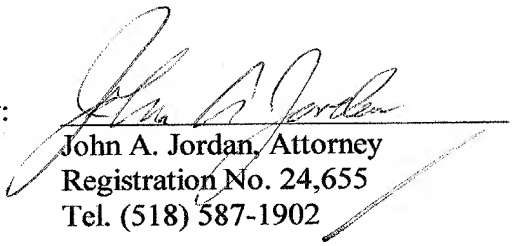
By: 

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"VERSION WITH MARKINGS TO SHOW CHANGES MADE".

Claim 26. An electronic package comprising:

a first circuitized substrate having at least one conductive aperture therein having an external surface;

a second circuitized substrate having at least one conductive aperture therein having an external surface, said first and second circuitized substrates aligned such that said at least one conductive aperture of said first circuitized substrate is substantially aligned with said at least one conductive aperture of said second circuitized substrate, said at least one conductive aperture of said first circuitized substrate and said at least one conductive aperture of said second [first] circuitized substrate including a conductive metallic layer thereon selected from the group consisting of copper, nickel, gold, chromium, solder and alloys thereof; and

at least one solder member including a first contact portion extending from said external surface of said conductive aperture of said first circuitized substrate, said first contact portion including a cross-sectional configuration that is substantially round, oval or ellipsoidal, and a second contact portion extending substantially within both of said aligned conductive apertures of said first and second circuitized substrates to at least said external surface of said conductive aperture of said second circuitized substrate to secure said circuitized substrates together [,said metallic material of said at least one conductive aperture of said first circuitized substrate and said at least one conductive aperture of said second circuitized substrate including a protective layer thereon, said protective layer selected from the group consisting of benzatriozole, chlorite, and immersion tin].

Claim 28. The electronic package of Claim 26 wherein said conductive metallic layer is copper including a protective layer thereon, said protective layer selected from the group consisting of benzotriazole, chlorite, and immersion tin [at least one conductive aperture of said first circuitized substrate and said at least one conductive aperture of said second circuitized substrate comprises a hole having a cylindrical shape].